Capital Metro Downtown Station Street Traffic Analysis

Background:

Council Resolution 20160225-045 directed staff to work with Capital Metro and the Downtown Austin Alliance on a comprehensive review of the area surrounding the proposed Capital Metro downtown rail station and to complete the necessary traffic studies and analysis for the area around the station. A memo was distributed on October 4, 2016, with an update on staff involvement for the proposed development of the station and the plaza.

At the direction of Council, the Austin Transportation Department (ATD) completed a traffic analysis of the proposed East 4th Street Station to be constructed between Red River Street and Trinity Street. The proposed plan would require that two links in the East 4th Street grid be restricted to pedestrian, bike and transit use only. The plan requires that Neches Street be terminated in a cul-de-sac at its intersection with East 4th Street. Three train platforms would be constructed in East 4th Street between Red River and Neches Streets. A pedestrian plaza would be constructed between Neches and Trinity Streets (See attachment 1).

To achieve the plan, vehicular traffic would be restricted from the project blocks. East 4th Street would be limited to local traffic between the SB IH 35 Frontage Road and Red River Street. East of Trinity, there are no plans for modifications to East 4th Street.

Several stakeholders have expressed concern with closing portions of East 4th Street to automobile traffic, including the Greater Austin Chamber of Commerce which offices in the Hilton building, the Hilton, and the Convention Center. To examine these concerns, ATD conducted analysis of the existing grid configuration and also of a concept that would convert East 5th Street to two-way traffic between IH 35 and Brazos Street as a replacement for loosing capacity in the East 4th Street corridor. East 5th Street would be provided with one lane westbound, and two lanes eastbound. Both the evening commute (PM Peak period) and a typical special event scenario where East 6th Street is closed due to an event were evaluated. These two time periods represent the highest volume periods for this portion of the grid.

A memorandum was sent to Mayor and Council on October 4, 2016 with an update on staff involvement with the potential redevelopment of Capital Metro's downtown rail station.

Data:

Traffic counts, including pedestrian and bicycle counts, were collected by Capital Metro and their engineering consultant. Additional counts and observations of garage loading and unloading were made by ATD. Travel time data were harvested by ATD signals engineers from the City's smart signal network. Travel times during a period when one lane of East 5th Street was shut down due to construction as well as when all three lanes eastbound were available were used in the analysis.

Findings:

Analysis of both scenarios (PM Peak and Special Event) indicates that the most critical traffic flows occur when westbound East 6th Street is closed as it is nearly every Thursday, Friday, and Saturday nights. Both the model and observational experience indicate that a traffic queue forms along the southbound Frontage Rd from traffic seeking access into the grid. Vehicles turn on East 4th Street because it is the first available westbound link. Trips also continue south to Cesar Chavez to move even further to the west.

Queues along the frontage road routinely back up and block eastbound trips on East 5th Street at the Frontage Rd., causing a subsequent backup on 5th Street. Likewise, trips entering the grid on East 4th Street often try to turn north on Red River, Trinity and Brazos Streets where they run into road closures or the traffic congestion backing up along East 5th Street. This condition results in circular congestion where each link in the grid is "locked" by the congestion of the intersecting street, thus nothing moves (e.g., gridlock). The PM Peak period analysis (as compared to the special event scenario) demonstrates far lower traffic congestion in this portion of the grid because East 6th Street is typically open and has available capacity.

Conversion of one lane on East 5th Street to provide westbound capacity between the Frontage Road and Brazos eliminates the potential for circular congestion because the traffic displaced from 6th Street is able to use the East 5th Street westbound lane before blocking the eastbound East 5th Street traffic stream. Because all the intersections along East 5th Street would be signalized, this street is better able to handle the volume and flow of westbound traffic as compared to the numerous stop-signed intersections on East 4th Street.

Eastbound traffic on East 5th Street is still provided with the two lanes it has today (only two lanes can turn right at the Frontage Road). During normal peak period conditions, queue length with or without the westbound East 5th Street treatment (e.g. with or without the closure of East 4th Street) are of equal length. During the PM Peak, eastbound travel times after conversion indicate only a few seconds increase, likely due to the introduction of left turns at signals along the corridor. Travel times westbound increase by 1 to 2 minutes when comparing the East 5th Street alternative to the existing East 4th Street configuration (see attachment 2). However, this affects approximately only 150 vehicles during the PM peak hour, many of which might be expected to divert to westbound 6th Street, and, even with the slightly longer travel times, the trips are accomplished with greatly reduced congestion levels on East 5th Street.

During special event operations, when East 6th Street is closed, congestion levels and travel times are significantly reduced with an East 5th Street eastbound lane (when East 4th Street is closed). Special events requiring East 6th Street to be closed occur several times weekly and cause considerable congestion within the grid. The significant improvement is due to the elimination of the circular congestion described above.

Access to the Hilton Garage and Convention Center:

The Hilton and Convention Center garages are benefited by the two-way operation on East 5th Street because two-way access to these garages and direct access to the 7th and 8th Street corridors is improved with a two-way East 5th Street. Parking along East 5th Street, will be converted to parallel where it is angled today. Additional parking capacity can be added to cross streets using angled parking so that the net impacts to parking are neutral or even positive.

Station Configuration:

The station is proposed for the block of East 4th Street between Red River and Neches between the Convention Center and Hilton Hotel. The block between Neches and Trinity is proposed as a pedestrian plaza/queueing area for the station. The width of existing Right of Way is 80 feet and there are multiple constraints in the block that lies between the Hilton and Convention Center.

On the Hilton side (north side of block), emergency exit doors for the Hilton open directly onto East 4th Street. The Austin Fire Department has specified that the 8-foot passageway provided at the emergency exit portal must serve as the minimum width of sidewalk along the north side for the length of the station. Because this sidewalk also serves as the north side sidewalk and station construction may require a barrier adjacent to the rail, ATD has communicated that the sidewalk should be no narrower than 10 feet and any barrier be visible from the emergency exit. On the Convention Center side (south side of block), ATD has communicated that a 10-foot pedestrian sidewalk and the Lance Armstrong Bikeway must be maintained (LAB). The LAB is a critical piece of infrastructure and currently carries over 1,000 people a day. ATD will allow the LAB width to be narrowed to 10 feet to accommodate existing and projected traffic. This leaves 50 feet which can be used for the station construction (see attachment).

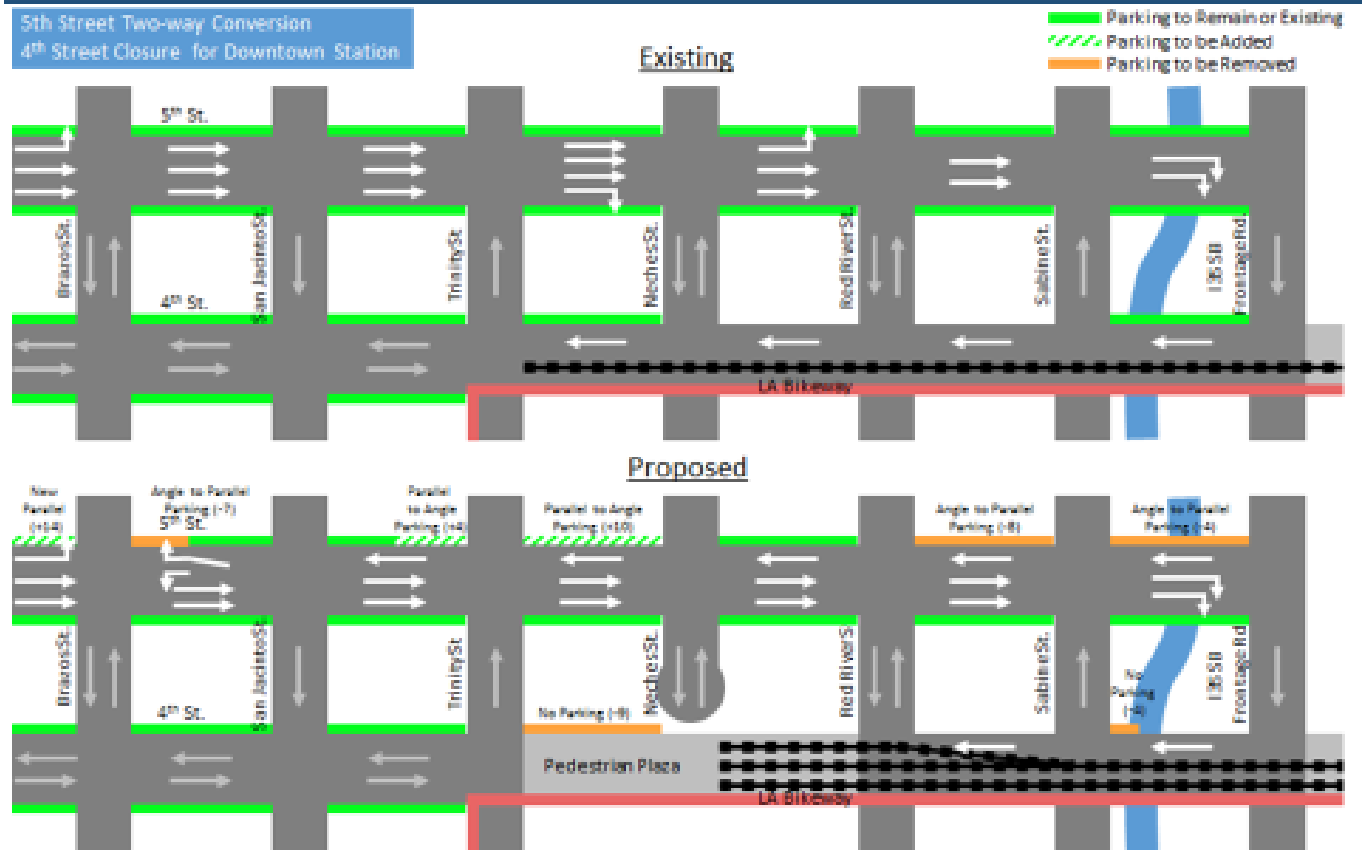
Recommendation:

Making East 5th Street two way (with 2-lanes eastbound and 1-lane westbound) provides significant congestion relief (regardless of the potential closure of East 4th Street). Closing two links of East 4th Street between Trinity and the I-35 Frontage road has little or no negative impact to the overall mobility provided by the southeast downtown grid if westbound capacity is provided on East 5th Street. In fact, the benefits to the traffic circulation during Special Event closures on East 6th Street are sufficiently significant that ATD recommends converting the existing East 5th Street configuration to add a westbound lane, regardless of the status of the downtown station.

From a traffic mobility perspective, staff believes the closure of East 4th Street for several blocks between Trinity and the Frontage Road is a viable approach to provide a more permanent transit station in Downtown Austin.

Attachment 1: Lane Configurations

Existing and Proposed Conditions



Attachment 2: Travel Times with/without links on 4th Street

Time Period	Direction	Street	Street and Direction	Travel Time (min)	Google Travel Time (min)
Entertainment Peak	WB	5th St.	After	3.5	NA
		4th St.	Before	11.8	5-9 Min.
	EB	5th St.	After	1.4	NA
			Before	14.8	3-7 Min.

Time Period	Direction	Street	Period	Travel Time (min)	Google Travel Time (min)
PM Peak	WB		6th St.	2.0	2 Min.
			C.Chavez	3.7	2-6 Min.
		5th St.	After	3.6	NA
		4th St.	Before	2.4	4 Min.
	EB	5th St.	After	2.1	NA
			Before	2.0	3 Min.

Attachment 3: Station Configuration